

Rotavirus serotype surveillance: Results and experiences in Tanzania

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OUTLINE

1. Introduction-burden of RVGE
2. goals of RVGE sentinel surveillance
3. Surveillance in Tanzania
4. Results, lessons learnt, way forward

BURDEN OF ROTAVIRUS GASTROENTERITIS

Rotavirus (RV) is the most common cause of severe gastroenteritis (GE) in children worldwide **1**

In children <5 years, RVGE is responsible for:

25 million outpatient visits per year (1986–2000 estimate)**3**

→2 million hospitalisations per year (1986–2000 estimate)**3**

WHO estimates that 453 000 child deaths occurred during 2008 due to rotavirus infection



–453,000 deaths (2008 estimate)**2**

→WHO Strategic Advisory Group of Experts (SAGE) recommended the inclusion of RV vaccination in all national immunisation programmes to reduce the burden of disease **4**

1. Parashar UD, et al. *J Infect Dis* 2009;200:S9–15;
2. Tate JE, et al. *Lancet Infect Dis* 2012;12:136–41;
3. Parashar UD, et al. *Emerg Infect Dis* 2003;9:565–72;
4. WHO. *Wkly Epidemiol Rec* 2009;84:213–36

SITUATION IN TANZANIA

- Diarrhea remains an important cause of morbidity and mortality among children under five (U5) in Tanzania.^(1,2)
- Prevalence of 15%, about 23 900 annual deaths ,11% of child mortality ⁽¹⁾
- Rotavirus infection accounts for significant proportion of these statistics.
 - Local Studies reported prevalence of 8.4 -43%⁽³⁻⁹⁾

1. WHO

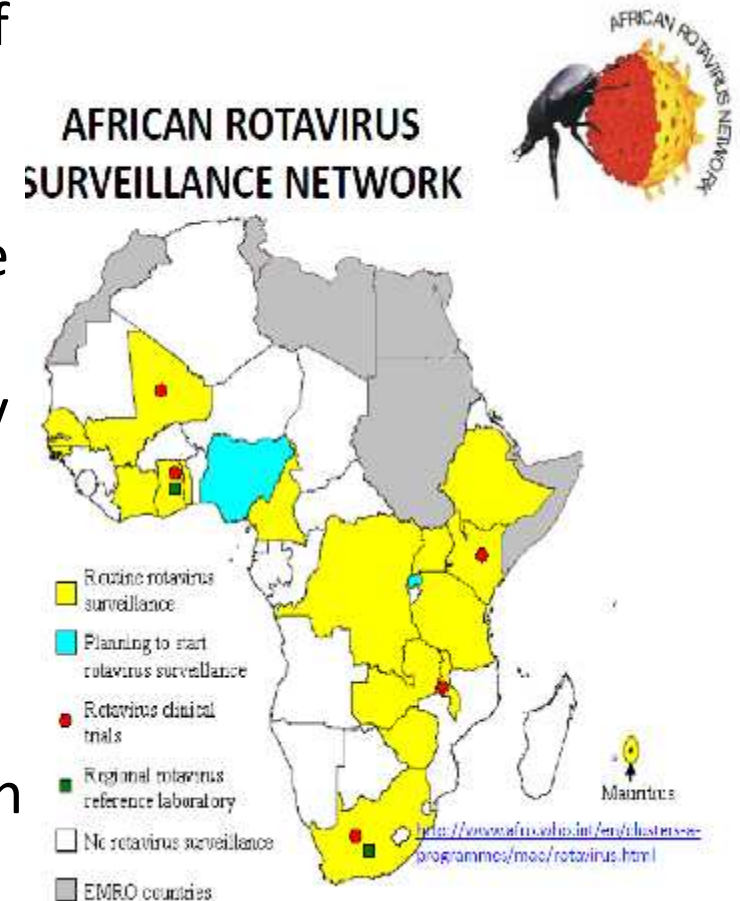
2. TDHS

3. 3-9. Brookfield et al 1976, Mhalu et al 1992, Sam et al 1992, Temu M et al 2002, , Gascon et al – 2000, Moyo et al 2007, Temu A et al 2009)

SENTINEL SURVEILLANCE FOR ROTAVIRUS

Key objectives

1. Contribute data to estimate the burden of disease due to rotavirus AGE in children < 5
2. Monitor circulating rotavirus strains in the AFR region
3. Support awareness and regional advocacy efforts for the introduction of rotavirus vaccines
4. Post marketing surveillance for AEFI (baseline data on IS)
5. Evaluate impact following the introduction of these new vaccines



SURVEILLANCE IN TANZANIA

2007-2013

The surveillance was initiated in Tanga (Bombo Hospital) – 2007.

Zanzibar (Mnazi mmoja) and Mwanza (Bugando Medical Centre)- 2010.



SURVEILLANCE IN TZ

- Rotavirus surveillance was initiated in Tanzania for the following purpose;
 - To estimate the incidence of hospitalizations associated with rotavirus among under -fives;
 - To determine the age and seasonal distribution of hospitalizations associated with rotavirus among under-fives;
 - To estimate the proportion of diarrhoea hospitalizations attributable to rotavirus among children under-fives and
 - To identify and characterize the prevalent strains of rotavirus in preparation for the introduction of vaccine.

METHODS

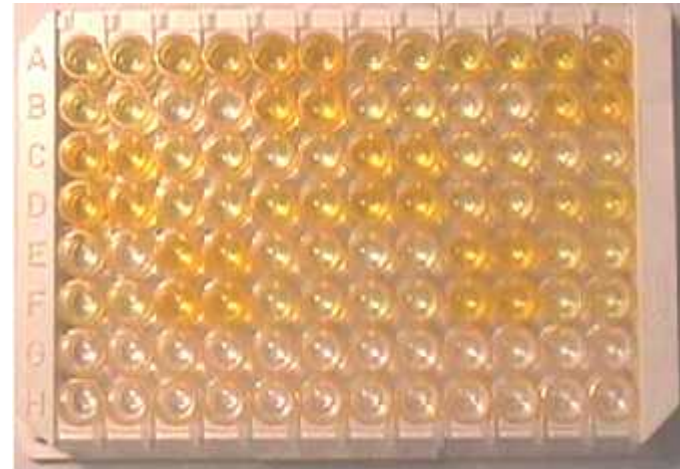
Inclusion criteria

- :
 - Child under five years of age
 - Admitted for treatment of acute gastroenteritis as a primary illness
 - Gastroenteritis of ≤ 7 days
 - Admitted to hospital ward (hospitalized), not out patient cases

Exclusion Criteria

- Presence of any of the following
 - Child aged equal or more than 5 years
 - Child with bloody diarrhoea
 - Child with symptoms > 7 days
 - Patient acquired gastroenteritis during hospitalization for treatment of other diseases (hospital acquired gastroenteritis)
- A child who met the inclusion criteria = eligible to be enrolled (eligible case) into the surveillance
- A child was considered to be enrolled when a case report/ investigation Form (CIF) is completed and a stool specimen taken
 - stool samples were taken within 48 hrs after admission and not more than 7 days after on set of acute diarrhea

- presence of rotavirus In stool samples was detected by Enzyme Linked Immunoassay (ELISA)
- 50 ELISA + samples from each site- randomly selected each year for Genotyping



METHODS

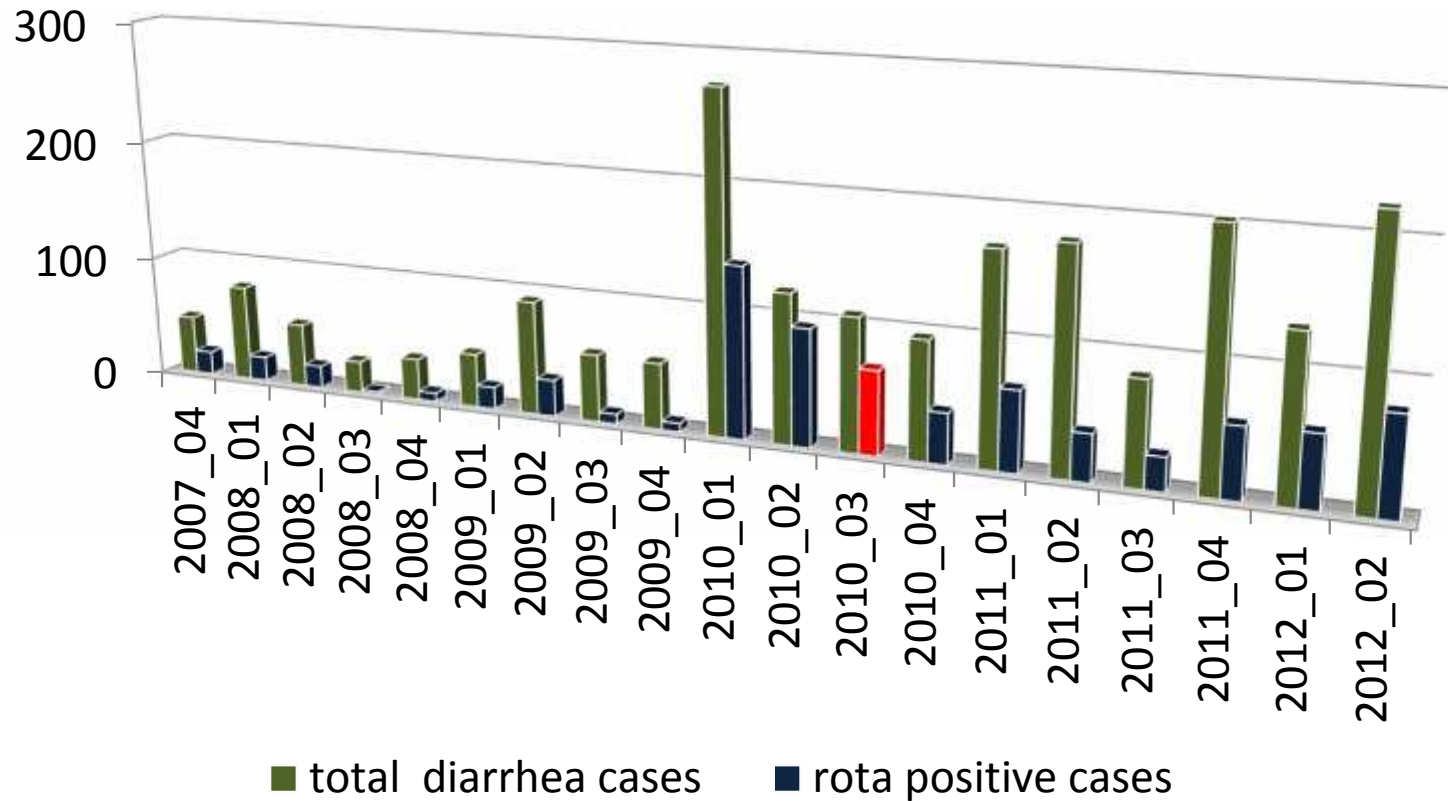
Using WHO SOPs

- Children under 5 years of age who were hospitalized with acute diarrhea were enrolled, and their stool specimens were collected.
- Enzyme immunoassay- DAKO kits were used to detect rotavirus.
- Rotavirus positive samples were sent to Regional reference laboratory (RRL) in Medunsa for quality control and genotyping.
- Rotavirus strains were characterized for G and P types with use of a reverse-transcriptase polymerase chain reaction (RT-PCR).

RESULTS

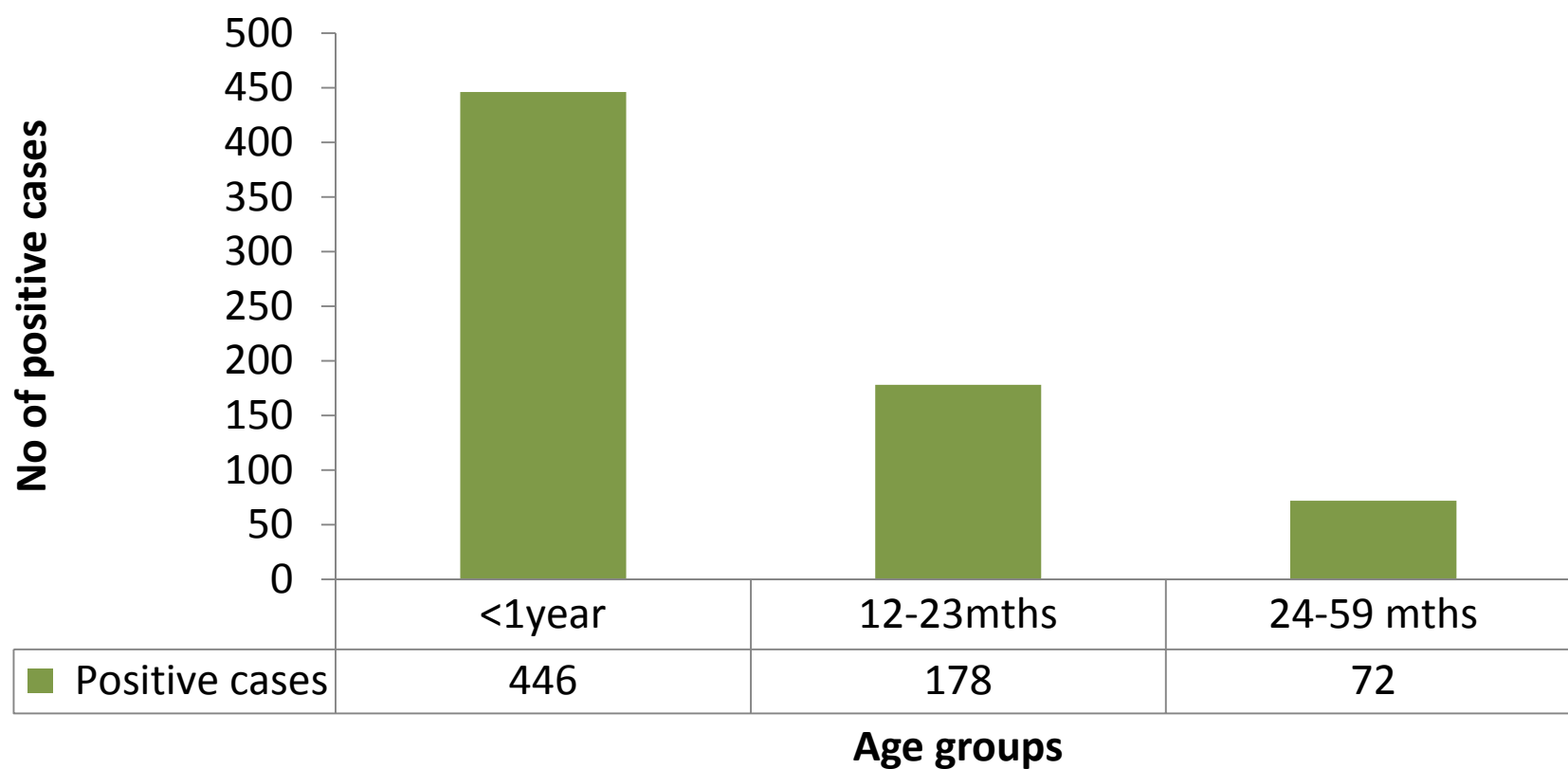
- From Nov 2007-June 2012; 2022 children were enrolled into the surveillance.
- Of 2022 children, 1998 (98%) stool samples were collected.
- Of 1998 collected samples 796(40%) were positive for rotavirus.
- Seasonal peaks, varied from year to year Jan-Feb in the first 2 years and Apr-June in the last two years.
- 88% of all rotavirus infections occurred among children below one year of age.
- Of 796 positive specimens, 308 (38.6%) specimens were sent to Regional Reference laboratory (RRL) for genotyping.
- Rotavirus infection was associated with a prolonged hospital stay and dehydration.

rotavirus cases per quarter

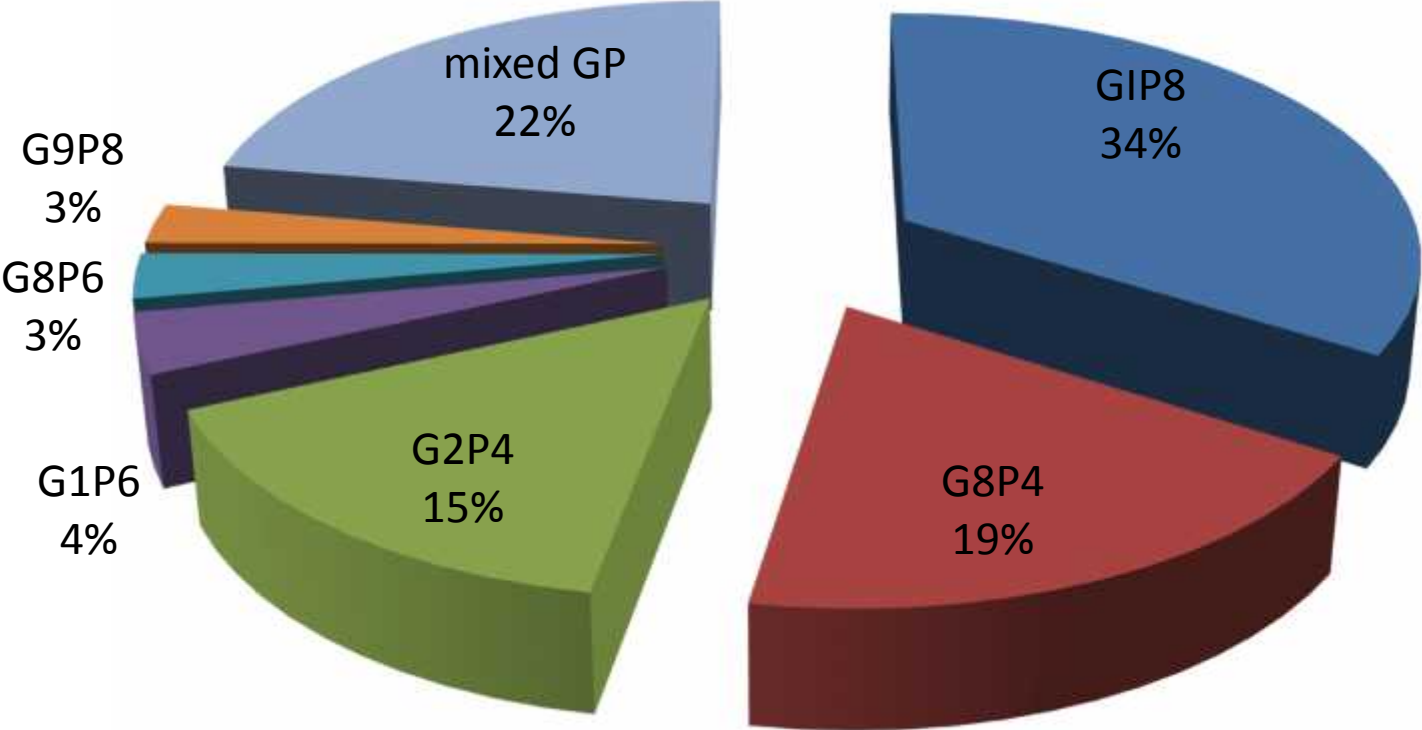


Total number of cases tested positive by age group from Nov 2007 to
June 2012

Positive cases



circulating genotypes 2008-2011



VACCINE INTRODUCTION

- Tanzania introduced the rotavirus vaccine into the routine immunization programme in Jan 2013.
- Vaccine introduced - Rotarix - human monovalent vaccine G1 with a potential for cross protection.



CONCLUSIONS

- Rotavirus infection is responsible for 40% of severe gastroenteritis in Tanzania.
- G1P8, G8P4, G2P4 are responsible for 68% of infections
- There is diversity of genotypes of rotavirus infection causing gastroenteritis.
- These results were used by MOH and WHO to lobby for Rotavirus vaccine introduction in TZ

Next steps

:

- Surveillance is continuing with new objectives- from May 2013
 1. Monitoring the vaccine impact on burden of rotavirus disease.
 2. Assessing vaccine effectiveness.
 3. Monitoring strain types.
 4. Follow up on AEFI- Intussusception

ACKNOWLEDGEMENTS

- WHO AFRO
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- Other partners, donors and stake holders in NVI

Ahsanteni sana!!!

